

IN THE CLAIMS:

1 Please amend the claims as follows:

1 1. (Currently amended) A method for managing a time-limited long-running proc-
2 ess carried out upon an array of disks, the method comprising the steps of:

3 establishing a registry having a plurality of entries, each ~~of entry with respect cor-~~
4 responding to each-one of a plurality of groups of disks ~~of in~~ the array of disks, each en-
5 try having a value indicative of a respective time at which ~~each of the~~ its corresponding
6 group of disks was last acted-upon by the long-running process; and

7 performing the long-running process on each of the groups of disks based upon an
8 order in which the ~~groups-group~~ having an oldest last acted-upon time ~~are~~ is processed
9 first and the ~~groups-group~~ having the newest last acted-upon time ~~are~~ is processed last.

1 2. (Original) The method as set forth in claim 1 further comprising updating a
2 value of the last acted-upon time for each of the groups as each of the groups is respec-
3 tively completely processed by the long running process.

1 3. (Currently amended) ~~The method as set forth in claim 2 further comprising~~ A
2 method for managing a time-limited long-running process carried out upon an array of
3 disks, the method comprising the steps of:

4 establishing a registry having a plurality of entries, each entry corre-
5 sponding to one of a plurality of groups of disks in the array of disks, each entry
6 having a value indicative of a respective time at which its corresponding group of
7 disks was last acted-upon by the long-running process;

8 performing the long-running process on each of the groups of disks based
9 upon an order in which the group having an oldest last acted-upon time is proc-
10 essed first and the group having the newest last acted-upon time is processed last;

11 updating a value of the last acted-upon time for each of the groups as each
12 of the groups is respectively completely processed by the long running process;
13 and
14 ceasing the long-running process based upon a time limit from an initia-
15 tion time of the long-running process.

1 4. (Original) The method as set forth in claim 3 wherein the step of ceasing the
2 long-running process includes ceasing the step of updating so that the groups not com-
3 pletely processed by the long-running process retain a previous value for their respective
4 last acted-upon time.

1 5. (Original) The method as set forth in claim 4 wherein the step of establishing
2 the registry entry includes providing a value for a last position in each of the groups at
3 which the long-running process was performed and wherein the step of ceasing the long-
4 running process includes providing, in each of the groups for which the long-running
5 process was not completed, the respective last position value.

1 6. (Original) The method as set forth in claim 5 wherein the groups each com-
2 prise groups of disks based upon a redundant array of independent disk (RAID) organi-
3 zation and the last position value is based upon a predetermined data stripe within each of
4 the respective groups of RAID-organized disks.

1 7. (Original) The method as set forth in claim 6 wherein the long-running proc-
2 ess comprises a RAID scrubbing process.

1 8. (Original) The method as set forth in claim 6 wherein the registry comprises a
2 set of key values including a volume-related file system identifier and a RAID group
3 identifier with respect to RAID groups within the volume.

- 1 9. (Original) The method as set forth in claim 8 wherein the registry is located
2 in a file that is read from at least one storage location on the array of disks.
- 1 10. (Original) The method as set forth in claim 6 further comprising sorting each
2 entry in the registry based upon the last acted-upon time value and establishing a process
3 queue, the order of which is the order in which the long-running process is performed on
4 respective of the groups.
- 1 11. (Original) The method as set forth in claim 5 further comprising setting a
2 value of the last acted-upon time for each of the groups that is newly added to the registry
3 to the oldest last acted-upon time.
- 1 12. (Original) The method as set forth in claim 11 wherein the last position value
2 for each of the newly added groups and the last position value for each of the groups
3 completely processed is a beginning group data location value.
- 1 13. (Original) The method as set forth in claim 10 further comprising defining a
2 plurality of working threads, each performing the long-running process, each of the
3 threads performing the process to a top entry in the process queue as each thread is ready
4 to take on one of the groups for processing thereon.
- 1 14. (Currently amended) A system for managing a time-limited long-running process
2 carried out upon an array of disks, the system comprising:
3 a registry having a plurality of entries, each entry corresponding to one that stores
4 an entry with respect to each of a plurality of groups of disks of in the array of disks, each
5 entry having a value indicative of a respective time at which each of the its corresponding
6 group of disks was last acted-upon by the long-running process; and
7 a sorting processor configured to perform the long-running process on each of the
8 groups of disks based upon an order in which the groups-group having an oldest last

9 acted-upon time ~~are~~is processed first and the ~~groups~~group having the newest last acted-
10 upon time ~~are~~is processed last.

1 15. (Original) The system as set forth in claim 14 further comprising means for
2 updating a value of the last acted-upon time for each of the groups as each of the groups
3 is respectively completely processed by the long running process.

1 16. (Currently amended) ~~The system as set forth in claim 15 further comprising~~ A
2 system for managing a time-limited long-running process carried out upon an array of
3 disks, the system comprising:

4 a registry having a plurality of entries, each entry corresponding to one of
5 a plurality of groups of disks in the array of disks, each entry having a value in-
6 dicative of a respective time at which its corresponding group of disks was last
7 acted-upon by the long-running process;

8 a processor configured to perform the long-running process on each of the
9 groups of disks based upon an order in which the group having an oldest last
10 acted-upon time is processed first and the group having the newest last acted-upon
11 time is processed last;

12 means for updating a value of the last acted-upon time for each of the
13 groups as each of the groups is respectively completely processed by the long
14 running process; and

15 a timer that ceases the long-running process based upon a time limit from
16 an initiation time of the long-running process.

1 17. (Original) The system as set forth in claim 16 wherein the timer is adapted to
2 cease the means for updating so that the groups not completely processed by the long-
3 running process retain a previous value for their respective last acted-upon time.

1 18. (Original) The system as set forth in claim 17 wherein each registry entry in-
2 cludes a value for a last position in each of the groups at which the long-running process
3 was performed and wherein each entry further includes a last position value for each of
4 the groups for which the long-running process was not completed.

1 19. (Original) The system as set forth in claim 18 wherein the groups each com-
2 prise groups of disks based upon a redundant array of independent disk (RAID) organi-
3 zation and the last position value is based upon a predetermined data stripe within each of
4 the respective groups of RAID-organized disks.

1 20. (Original) The system as set forth in claim 19 wherein the long-running proc-
2 ess comprises a RAID scrubbing process.

1 21. (Original) The system as set forth in claim 19 wherein the registry comprises
2 a file including a set of key values including a volume-related file system identifier and a
3 RAID group identifier with respect to RAID groups within the volume.

1 22. (Original) The system as set forth in claim 21 wherein the file system identi-
2 fier and the RAID group identifier correspond with a disk label file system identifier and
3 a disk label RAID group identifier located in a predetermined storage location on one or
4 more of the disks in the array of disks.

1 23. (Original) The system as set forth in claim 22 wherein a value of the last
2 acted-upon time for each of the groups that is newly added to the registry is set to the
3 oldest last acted-upon time.

1 24. (Original) The system as set forth in claim 23 wherein the last position value
2 for each of the newly added groups and the last position value for each of the groups
3 completely processed is a beginning group data location value.

1 25. (Original) The system as set forth in claim 24 further comprising a plurality
2 of working threads, each performing the long-running process, each of the threads per-
3 forming the process to a top entry in the process queue as each thread is ready to take on
4 one of the groups for processing thereon.

1 26. (Currently amended) A computer-readable medium including program instruc-
2 tions ~~executing for execution~~ on a computer for the practice of a method of managing a
3 time-limited long-running process carried out upon an array of disks, the ~~program in-~~
4 structions performing method comprising the steps of:
5 establishing a registry ~~of having a plurality of entries, each entry with respect cor-~~
6 responding to ~~each one of~~ a plurality of groups of disks ~~of in~~ the array of disks, ~~each en-~~
7 try having a value indicative of a respective time at which ~~each of the~~ its corresponding
8 group of disks was last acted-upon by the long-running process; and
9 performing the long-running process on each of the groups of disks based upon an
10 order in which the ~~groups-group~~ having an oldest last acted-upon time ~~are is~~ processed
11 first and the ~~groups-group~~ having the newest last acted-upon time ~~are is~~ processed last.

1 27. (Original) The computer-readable medium as set forth in claim 26 further
2 comprising updating a value of the last acted-upon time for each of the groups as each of
3 the groups is respectively completely processed by the long running process.

1 28. (Currently amended) ~~The computer-readable medium as set forth in claim 27~~
2 ~~further comprising~~ A computer-readable medium including program instructions for
3 execution on a computer for the practice of a method of managing a time-limited long-
4 running process carried out upon an array of disks, the method comprising the steps of:
5 establishing a registry having a plurality of entries, each entry corre-
6 sponding to one of a plurality of groups of disks in the array of disks, each entry

7 having a value indicative of a respective time at which its corresponding group of
8 disks was last acted-upon by the long-running process;

9 performing the long-running process on each of the groups of disks based
10 upon an order in which the group having an oldest last acted-upon time is proc-
11 essed first and the group having the newest last acted-upon time is processed last;

12 updating a value of the last acted-upon time for each of the groups as each
13 of the groups is respectively completely processed by the long running process;
14 and

15 ceasing the long-running process based upon a time limit from an initia-
16 tion time of the long-running process.

1 29. (Original) The computer-readable medium as set forth in claim 28 wherein
2 the step of ceasing the long-running process includes ceasing the step of updating so that
3 the groups not completely processed by the long-running process retain a previous value
4 for their respective last acted-upon time.

1 30. (Original) The computer-readable medium as set forth in claim 29 wherein
2 the step of establishing the registry entry includes providing a value for a last position in
3 each of the groups at which the long-running process was performed and wherein the step
4 of ceasing the long-running process includes providing, in each of the groups for which
5 the long-running process was not completed, the respective last position value.

1 31. (Original) The computer-readable medium as set forth in claim 30 wherein
2 the groups each comprise groups of disks based upon a redundant array of independent
3 disk (RAID) organization and the last position value is based upon a predetermined data
4 stripe within each of the respective groups of RAID-organized disks.

- 1 32. (Original) A data structure stored as an entry in a registry file for enabling a
2 time-limited long-running process to be carried out on the disk array, the data structure
3 comprising:
4 a file system identifier indicating a volume of the disk array and a group identifier
5 indicating a discrete storage organizational group of the volume, each of the file system
6 identifier and the group identifier corresponding with identifiers stored within one or
7 more disks of the array of disks; and
8 a last acted-upon time value representative of a time at which the long running
9 process was last performed on the group, the last acted-upon time adapted to be updated
10 to a current timestamp when the long-running process is completed on the group and to
11 be read so as to form a queue by which each group is processed by the long-running pro-
12 cess, with an oldest last acted-upon time value being processed first and a newest being
13 processed last.
- 1 33. (Original) The data structure as set forth in claim 32 further comprising a last
2 data position value that indicates a last data position within a group that has been proc-
3 essed by the long-running process adapted so that the long-running process begins proc-
4 essing at the last data position in the group.
- 1 34. (Original) The data structure as set forth in claim 33 wherein the last data po-
2 sition is set to a beginning data position if the group is newly added or completely proc-
3 essed in a previous run of the long-running process.
- 1 35. (Original) The data structure as set forth in claim 32 wherein each group
2 comprises a group organized as a redundant array of independent disks (RAID) the group
3 identifier comprises a RAID group identifier.

Kindly add the following new claims 36-40:

1 36. (New) A method for managing a time-limited long-running process carried out
2 upon a plurality of groups of disks, the method comprising:
3 associating a last acted-upon time with each group of disks in the plurality of
4 groups of disks, each last acted-upon time indicating when its associated group of disks
5 was last acted upon by the long-running process;
6 sorting the groups of disks chronologically based upon their associated last acted-
7 upon times; and
8 performing the long-running process on each of the groups of disks in the order in
9 which the groups of disks were sorted.

1 37. (New) A method for managing a time-limited long-running process carried out
2 upon a plurality of groups of disks, the method comprising:
3 associating a last acted-upon time with each group of disks in the plurality of
4 groups of disks, each last acted-upon time indicating when its associated group of disks
5 was last acted upon by the long-running process; and
6 performing the long-running process on each of the groups of disks in a chrono-
7 logical order determined by the last acted-upon times associated with the groups of disks.

1 38. (New) A system that manages a time-limited long-running process carried out
2 upon a plurality of groups of disks, the system comprising:
3 means for associating a last acted-upon time with each group of disks in the plu-
4 rality of groups of disks, each last acted-upon time indicating when its associated group
5 of disks was last acted upon by the long-running process; and

6 means for performing the long-running process on each of the groups of disks in a
7 chronological order determined by the last acted-upon times associated with the groups of
8 disks.

1 39. (New) A computer-readable medium including program instructions for execu-
2 tion on a computer for the practice of a method of managing a time-limited long-running
3 process carried out upon a plurality of groups of disks, the method comprising:
4 associating a last acted-upon time with each group of disks in the plurality of
5 groups of disks, each last acted-upon time indicating when its associated group of disks
6 was last acted upon by the long-running process; and
7 performing the long-running process on each of the groups of disks in a chrono-
8 logical order determined by the last acted-upon times associated with the groups of disks.

1 40. (New) A computer system, comprising:
2 a processor;
3 an array of disks accessible to the processor, the array of disks being logically ar-
4 ranged as a plurality of groups of disks; and
5 a memory adapted to store instructions for execution by the processor, at least
6 some of the instructions for implementing a time-limited long-running process carried out
7 upon the plurality of groups of disks, the long-running process being configured to:
8 associate a last acted-upon time with each group of disks in the plurality of
9 groups of disks, each last acted-upon time indicating when its associated group of
10 disks was last acted upon by the long-running process; and
11 perform the long-running process on each of the groups of disks in a
12 chronological order determined by the last acted-upon times associated with the
13 groups of disks.